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Sec 2.16

<120> Plant-derived molecules and genetic sequences encoding same and uses therefor

<140> not yet assigned

<150> USSN 60/267,271

<160> 61

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<213> primer

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aaa cca cca tgc aga aaa gct tgt atc agt gag aaa ttt act gat ggt 96  
Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly  
20 25 30

cat tgt agc aaa atc ctc aga agg tgc cta tgt act aag cca tgt 141  
His Cys Ser Lys Ile Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys  
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ctc ttt gtt gcc tat gag gtg caa gct 75  
Leu Phe Val Ala Tyr Glu Val Gln Ala  
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gaa gca aaa act ttg gct gca gct ttg ctt gaa gaa gag ata atg gat 96  
Glu Ala Lys Thr Leu Ala Ala Ala Leu Leu Glu Glu Glu Ile Met Asp  
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Asn

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1 5 10 15  
  
ctc ttt gtt gcc tat gag gtg caa gct aga gaa tgc aaa aca gaa agc 96  
Leu Phe Val Ala Tyr Glu Val Gln Ala Arg Glu Cys Lys Thr Glu Ser  
20 25 30  
  
aac aca ttt cct gga ata tgc att acc aaa cca cca tgc aga aaa gct 144  
Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
35 40 45  
  
tgt atc agt gag aaa ttt act gat ggt cat tgt agc aaa atc ctc aga 192  
Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg  
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agg tgc cta tgt act aag cca tgt 216  
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Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
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aaa cca cca tgc aga aaa gct tgt atc agt gag aaa ttt act gat ggt 96  
Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly  
20 25 30

cat tgt agc aaa atc ctc aga agg tgc cta tgt act aag cca tgt gtg 144  
His Cys Ser Lys Ile Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys Val  
35 40 45

ttt gat gag aag atg act aaa aca gga gct gaa att ttg gct gag gaa 192  
Phe Asp Glu Lys Met Thr Lys Thr Gly Ala Glu Ile Leu Ala Glu Glu  
50 55 60

gca aaa act ttg gct gca gct ttg ctt gaa gaa gag ata atg gat aac 240  
Ala Lys Thr Leu Ala Ala Ala Leu Leu Glu Glu Glu Ile Met Asp Asn  
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20 25 30

His Cys Ser Lys Ile Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys Val  
35 40 45

Phe Asp Glu Lys Met Thr Lys Thr Gly Ala Glu Ile Leu Ala Glu Glu  
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1 5 10 15

- vi -

ctc ttt gtt gcc tat gag gtg caa gct aga gaa tgc aaa aca gaa agc 96  
 Leu Phe Val Ala Tyr Glu Val Gln Ala Arg Glu Cys Lys Thr Glu Ser  
                   20                  25                  30

aac aca ttt cct gga ata tgc att acc aaa cca cca tgc aga aaa gct 144  
 Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
                   35                  40                  45

tgt atc agt gag aaa ttt act gat ggt cat tgt agc aaa atc ctc aga 192  
 Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg  
                   50                  55                  60

agg tgc cta tgt act aag cca tgt gtg ttt gat gag aag atg act aaa 240  
 Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Thr Lys  
                   65                  70                  75                  80

aca gga gct gaa att ttg gct gag gaa gca aaa act ttg gct gca gct 288  
 Thr Gly Ala Glu Ile Leu Ala Glu Glu Ala Lys Thr Leu Ala Ala Ala  
                   85                  90                  95

ttg ctt gaa gaa gag ata atg gat aac taa ttagagatta gaagaaatta 338  
 Leu Leu Glu Glu Glu Ile Met Asp Asn  
                   100                  105

aggatgcagt atcacacata ataaagtttc tacctttctt aaaagtgtag ctaatgttgt 398

gttttaattg gcttttagta gccttttatt acactttaaa taagtgtggc acttcaatcc 458

tttgtgcaat cttgcactaa gtttatttgt gtacttttaa tgaaaatgac cttctatggt 518

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                   20                  25                  30

Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
                   35                  40                  45

Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg  
                   50                  55                  60

Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Thr Lys  
 65                  70                  75                  80

Thr Gly Ala Glu Ile Leu Ala Glu Glu Ala Lys Thr Leu Ala Ala Ala  
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- vii -

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 taagtgtggc acttcaatcc tttgtgcaat cttgcactaa gtttatttgt gtacttttaa 180  
 tgaaaatgac cttctatggg ctttggttaa aaaaaaaaaa aaa 223

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 Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
 35 40 45  
 Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Leu Leu Arg  
 50 55 60  
 Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Ile Lys  
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 Thr Gly Ala Glu Thr Leu Val Glu Glu Ala Lys Thr Leu Ala Ala Ala  
 85 90 95  
 Leu Leu Glu Glu Glu Ile Met Asp Asn  
 100 105

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 <211> 105  
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 Ser Gln Thr Phe Pro Gly Leu Cys Phe Met Asp Ser Ser Cys Arg Lys  
 35 40 45  
 Tyr Cys Ile Lys Glu Lys Phe Thr Gly Gly His Cys Ser Lys Leu Gln  
 50 55 60



- viii -

Arg Lys Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Lys Ile Ser Ser  
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Glu Val Lys Ala Thr Leu Gly Glu Glu Ala Lys Thr Leu Ser Glu Val  
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Val Leu Glu Glu Glu Ile Met Met Glu  
100 105

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<211> 78

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<213> peptide

<400> 22

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Leu Val Thr Ala Thr Glu Met Gly Pro Met Thr Ile Ala Glu Ala Arg  
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Thr Cys Glu Ser Gln Ser His Arg Phe Lys Gly Pro Cys Ser Arg Asp  
35 40 45

Ser Asn Cys Ala Thr Val Cys Leu Thr Glu Gly Phe Ser Gly Gly Arg  
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Cys Pro Trp Ile Pro Pro Arg Cys Phe Cys Thr Ser Pro Cys  
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<211> 78

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<400> 23

Met Gly Arg Ser Ile Arg Leu Phe Ala Thr Phe Phe Leu Ile Ala Met  
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Leu Phe Leu Ser Thr Glu Met Gly Pro Met Thr Ser Ala Glu Ala Arg  
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Thr Cys Glu Ser Gln Ser His Arg Phe His Gly Thr Cys Val Arg Glu  
35 40 45

Ser Asn Cys Ala Ser Val Cys Gln Thr Glu Gly Phe Ile Gly Gly Asn  
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Cys Arg Ala Phe Arg Arg Arg Cys Phe Cys Thr Arg Asn Cys  
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<210> 24

<211> 77

<212> PRT

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<400> 24

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Met Lys Leu Ser Met Arg Leu Ile Ser Ala Val Leu Ile Met Phe Met  
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Ile Phe Val Ala Thr Gly Met Gly Pro Val Thr Val Glu Ala Arg Thr  
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Cys Glu Ser Gln Ser His Arg Phe Lys Gly Thr Cys Val Ser Ala Ser  
35 40 45

Asn Cys Ala Asn Val Cys His Asn Glu Gly Phe Val Gly Gly Asn Cys  
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Arg Gly Phe Arg Arg Arg Cys Phe Cys Thr Arg His Cys  
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Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly  
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His Cys Ser Lys Leu Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys  
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Asp Ser Ser Cys Arg Lys Tyr Cys Ile Lys Glu Lys Phe Thr Gly Gly  
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His Cys Ser Lys Leu Gln Arg Lys Cys Leu Cys Thr Lys Pro Cys  
35 40 45

<210> 27

<211> 47

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<400> 27

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Asp Ser Asn Cys Ala Ser Val Cys Glu Thr Glu Arg Phe Ser Gly Gly  
20 25 30

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Asn Cys His Gly Phe Arg Arg Arg Cys Phe Cys Thr Lys Pro Cys  
35 40 45

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Arg Val Cys Glu Ser Gln Ser His Gly Phe His Gly Leu Cys Asn Arg  
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Asp His Asn Cys Ala Leu Val Cys Arg Asn Glu Gly Phe Ser Gly Gly  
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Arg Cys Lys Gly Phe Arg Arg Arg Cys Phe Cys Thr Arg Ile Cys  
35 40 45

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Glu Ser Asn Cys Ala Ser Val Cys Gln Thr Glu Gly Phe Ile Gly Gly  
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Asn Cys Arg Ala Phe Arg Arg Arg Cys Phe Cys Thr Arg Asn Cys  
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Asn Cys Asp Gly Pro Leu Arg Arg Cys Lys Cys Met Arg Arg Cys  
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<210> 31  
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His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr  
35 40 45

Phe Pro Cys  
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Asp Ser Asn Cys  
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<210> 33  
<211> 51  
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Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly  
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35 40 45

Phe Pro Cys  
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<212> PRT  
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His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr  
35 40 45

Phe Pro Cys  
50

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 His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr  
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 Tyr Phe Pro Cys  
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 Asn Cys Asp Gly Pro Phe Arg Arg Cys Lys Cys Ile Arg Gln Cys  
 35 40 45

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<400> 38

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Lys Val Cys Arg Gln Arg Ser Ala Gly Phe Lys Gly Pro Cys Val Ser  
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Asp Lys Asn Cys Ala Gln Val Cys Leu Gln Glu Gly Trp Gly Gly Gly  
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Asn Cys Asp Gly Pro Phe Arg Arg Cys Lys Cys Ile Arg Gln Cys  
35 40 45

<210> 39

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<400> 39

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Gly Arg Cys Arg Asp Asp Val Arg Cys Trp Cys Thr Arg Asn Cys  
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<210> 41

<211> 48

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1          5          10          15

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Asp His Asn Cys Ala Gln Val Cys Leu Gln Glu Gly Trp Gly Gly Gly  
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- xiv -

<213> peptide

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Thr Gly His Cys  
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<211> 47

<212> PRT

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<400> 43

Arg Val Cys Met Lys Gly Ser Gln His His Ser Phe Pro Cys Ile Ser  
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Asp Arg Leu Cys Ser Asn Glu Cys Val Lys Glu Glu Gly Gly Trp Thr  
20 25 30

Ala Gly Tyr Cys His Leu Arg Tyr Cys Arg Cys Gln Lys Ala Cys  
35 40 45

<210> 44

<211> 45

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Asn Thr Cys Glu Asn Leu Ala Gly Ser Tyr Lys Gly Val Cys Phe Gly  
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Gly Cys Asp Arg His Cys Arg Thr Gln Glu Gly Ala Ile Ser Gly Arg  
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Cys Arg Asp Asp Phe Arg Cys Trp Cys Thr Lys Asn Cys  
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<210> 45

<211> 50

<212> PRT

<213> peptide

<400> 45

Leu Cys Asn Glu Arg Pro Ser Gln Thr Trp Ser Gly Asn Cys Gly Asn  
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Thr Ala His Cys Asp Lys Gln Cys Gln Asp Trp Glu Lys Ala Ser His  
20 25 30

Gly Ala Cys His Lys Arg Glu Asn His Trp Lys Cys Phe Cys Tyr Phe  
35 40 45

Asn Cys  
50





- xvi -

Asn Leu Cys Glu Arg Ala Ser Leu Thr Trp Thr Gly Asn Cys Gly Asn  
1 5 10 15

Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His  
20 25 30

Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asn  
35 40 45

Cys

<210> 50  
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<212> PRT  
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Phe Thr Gly Leu Cys Ile Thr Asn Pro Gln Cys Arg Lys Ala Cys Ile  
20 25 30

Lys Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg Arg Cys  
35 40 45

Leu Cys Thr Lys Pro Cys Thr Gly Ala Glu Thr Leu Ala Glu Glu Ala  
50 55 60

Thr Thr Leu Ala Ala Ala Leu Leu Glu Glu Glu Ile Met Asp Asn  
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20 25 30

Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala  
35 40 45

Cys Ile Lys Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg  
50 55 60

Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Ile Lys  
65 70 75 80

Thr Gly Ala Glu Thr Leu Ala Glu Glu Ala Thr Thr Leu Ala Ala Ala  
85 90 95

Leu Leu Glu Glu Glu Ile Met Asp Asn

- xvii -

100

105

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Met Ala Arg Ser Leu Cys Phe Met Ala Phe Ala Val Leu Ala Met Met  
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20 25 30  
Ser Asn Thr Phe Pro Gly Leu Cys Ile Thr Lys Pro Pro Cys Arg Lys  
35 40 45  
Ala Cys Leu Ser Glu Lys Phe Thr Asp Gly Lys Cys Ser Lys Ile Leu  
50 55 60  
Arg Arg Cys Ile Cys Tyr Lys Pro Cys Val Phe Asp Gly Lys Met Ile  
65 70 75 80  
Gln Thr Gly Ala Glu Asn Leu Ala Glu Glu Ala Glu Thr Leu Ala Ala  
85 90 95  
Ala Leu Leu Glu Glu Glu Met Met Asp Asn  
100 105

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20 25 30  
Arg Cys Pro Trp Ile Pro Pro Arg Cys Phe Cys Thr Ser Pro Cys  
35 40 45

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- xviii -

&lt;212&gt; PRT

&lt;213&gt; peptide

&lt;400&gt; 55

Arg	Thr	Cys	Glu	Ser	Gln	Ser	His	Arg	Phe	Lys	Gly	Thr	Cys	Val	Ser
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Ala	Ser	Asn	Cys	Ala	Asn	Val	Cys	His	Asn	Glu	Gly	Phe	Val	Gly	Gly
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Asn	Cys	Arg	Gly	Phe	Arg	Arg	Arg	Cys	Phe	Cys	Thr	Arg	His	Cys
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&lt;210&gt; 56

&lt;211&gt; 1104

&lt;212&gt; DNA

&lt;213&gt; Nicotiana alata

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1) .. (1104)

&lt;400&gt; 56

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Lys	Ala	Cys	Thr	Leu	Asn	Cys	Asp	Pro	Arg	Ile	Ala	Tyr	Gly	Val	Cys	
1				5				10					15			

ccg	cgt	tca	gaa	gaa	aag	aag	aat	gat	cgg	ata	tgc	acc	aac	tgt	tgc	96
Pro	Arg	Ser	Glu	Glu	Lys	Lys	Asn	Asp	Arg	Ile	Cys	Thr	Asn	Cys	Cys	
			20					25					30			

gca	ggc	acg	aag	ggg	tgt	aag	tac	ttc	agt	gat	gat	gga	act	ttt	gtt	144
Ala	Gly	Thr	Lys	Gly	Cys	Lys	Tyr	Phe	Ser	Asp	Asp	Gly	Thr	Phe	Val	
			35				40					45				

tgt	gaa	gga	gag	tct	gat	cct	aga	aat	cca	aag	gct	tgt	acc	tta	aac	192
Cys	Glu	Gly	Glu	Ser	Asp	Pro	Arg	Asn	Pro	Lys	Ala	Cys	Thr	Leu	Asn	
	50					55					60					

tgt	gat	cca	aga	att	gcc	tat	gga	gtt	tgc	ccg	cgt	tca	gaa	gaa	aag	240
Cys	Asp	Pro	Arg	Ile	Ala	Tyr	Gly	Val	Cys	Pro	Arg	Ser	Glu	Glu	Lys	
65					70				75				80			

aag	aat	gat	cgg	ata	tgc	acc	aac	tgt	tgc	gca	ggc	acg	aag	ggg	tgt	288
Lys	Asn	Asp	Arg	Ile	Cys	Thr	Asn	Cys	Cys	Ala	Gly	Thr	Lys	Gly	Cys	
			85					90					95			

aag	tac	ttc	agt	gat	gat	gga	act	ttt	gtt	tgt	gaa	gga	gag	tct	gat	336
Lys	Tyr	Phe	Ser	Asp	Asp	Gly	Thr	Phe	Val	Cys	Glu	Gly	Glu	Ser	Asp	
			100					105					110			

cct	aga	aat	cca	aag	gct	tgt	cct	cgg	aat	tgc	gat	cca	aga	att	gcc	384
Pro	Arg	Asn	Pro	Lys	Ala	Cys	Pro	Arg	Asn	Cys	Asp	Pro	Arg	Ile	Ala	
			115				120					125				

tat	ggg	att	tgc	cca	ctt	gca	gaa	gaa	aag	aag	aat	gat	cgg	ata	tgc	432
Tyr	Gly	Ile	Cys	Pro	Leu	Ala	Glu	Glu	Lys	Lys	Asn	Asp	Arg	Ile	Cys	

- xix -

130	135	140	
acc aac tgt tgc gca ggc aaa aag ggt tgt aag tac ttt agt gat gat Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp 145 150 155 160			480
gga act ttt gtt tgt gaa gga gag tct gat cct aaa aat cca aag gcc Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala 165 170 175			528
tgt cct cgg aat tgt gat gga aga att gcc tat ggg att tgc cca ctt Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu 180 185 190			576
tca gaa gaa aag aag aat gat cgg ata tgc acc aac tgc tgc gca ggc Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly 195 200 205			624
aaa aag ggt tgt aag tac ttt agt gat gat gga act ttt gtt tgt gaa Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu 210 215 220			672
gga gag tct gat cct aaa aat cca aag gct tgt cct cgg aat tgt gat Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp 225 230 235 240			720
gga aga att gcc tat ggg att tgc cca ctt tca gaa gaa aag aag aat Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn 245 250 255			768
gat cgg ata tgc aca aac tgt tgc gca ggc aaa aag ggc tgt aag tac Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr 260 265 270			816
ttt agt gat gat gga act ttt gtt tgt gaa gga gag tct gat cct aga Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Arg 275 280 285			864
aat cca aag gcc tgt cct cgg aat tgt gat gga aga att gcc tat gga Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly 290 295 300			912
att tgc cca ctt tca gaa gaa aag aag aat gat cgg ata tgc acc aat Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn 305 310 315 320			960
tgt tgc gca ggc aag aag ggc tgt aag tac ttt agt gat gat gga act Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr 325 330 335			1008
ttt att tgt gaa gga gaa tct gaa tat gcc agc aaa gtg gat gaa tat Phe Ile Cys Glu Gly Glu Ser Glu Tyr Ala Ser Lys Val Asp Glu Tyr 340 345 350			1056
gtt ggt gaa gtg gag aat gat ctc cag aag tct aag gtt gct gtt tcc Val Gly Glu Val Glu Asn Asp Leu Gln Lys Ser Lys Val Ala Val Ser 355 360 365			1104

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 35 40 45

Cys Glu Gly Glu Ser Asp Pro Arg Asn Pro Lys Ala Cys Thr Leu Asn  
 50 55 60

Cys Asp Pro Arg Ile Ala Tyr Gly Val Cys Pro Arg Ser Glu Glu Lys  
 65 70 75 80

Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Thr Lys Gly Cys  
 85 90 95

Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp  
 100 105 110

Pro Arg Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Pro Arg Ile Ala  
 115 120 125

Tyr Gly Ile Cys Pro Leu Ala Glu Glu Lys Lys Asn Asp Arg Ile Cys  
 130 135 140

Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp  
 145 150 155 160

Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala  
 165 170 175

Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu  
 180 185 190

Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly  
 195 200 205

- xxi -

Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu  
210 215 220

Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp  
225 230 235 240

Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn  
245 250 255

Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr  
260 265 270

Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Arg  
275 280 285

Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly  
290 295 300

Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn  
305 310 315 320

Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr  
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- XXIV -

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- xxxii -

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<220>

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$$\langle 222 \rangle \quad (43) \dots (43)$$

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- xxxiv -

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- XXXV -

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- xxxvi -

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- xxxvii -

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- xxxviii -

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	50					55				60						
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